

3. Let X be a discrete random variable with mgf $M_X(t)$, and let $Y = aX + b$. Write the definition of $M_Y(t)$. Replace Y with $aX + b$ and simplify the expected value to show that $M_Y(t) = e^{tb}M(at)$.

4. Let X represent the number of insurance policies sold by an agent in a day. The moment generating function of X is

$$M_X(t) = 0.45e^t + 0.35e^{2t} + 0.15e^{3t} + 0.05e^{4t}, \quad \text{for } -\infty < t < \infty.$$

Calculate the standard deviation of X .

(Actuary Exam P practice problem)

5. What do you think is the distribution of the random variable X in problem 4?